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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/821,913      | 04/12/2004  | Hideki Sato          | P9219.0007          | 2455             |

38881 7590 06/14/2007  
DICKSTEIN SHAPIRO LLP  
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NEW YORK, NY 10036-2714

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| EXAMINER |
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SCHINDLER, DAVID M

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

2862

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| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

06/14/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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|------------------------------|-----------------|--------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |  |
|                              | 10/821,913      | SATO ET AL.  |  |
| Examiner                     | Art Unit        | 2862         |  |
| David M. Schindler           |                 |              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 06 March 2007.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 2-16 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 2,4-7 and 9-16 is/are rejected.  
 7) Claim(s) 3 and 8 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 12 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. 10/052,525.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       |   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
|  | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. This action is in response to the Request for Continued Examination filed 3/6/2007.

***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the square shape as the rectangular shape claimed in claims 10, 12, 14, and 16 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the

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filling date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 4-6, 10, and 12-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As to Claim 4,

Applicant has claimed eight different elements in this

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claim, each of which contain a similar new matter issue. This issue will be discussed using the first element as an example.

The phrase "said first element being formed at a position closer to the left side than the other sides and below a first center line of the top side and the bottom side" on lines 22-24 does not appear to be supported by the original disclosure and therefore introduces new matter. Specifically, the Examiner notes that applicant has claimed that the substrate has a rectangular shape which has a left side along a Y-axis, a right side along the Y-axis, a top side along an X-axis, and a bottom side along the X-axis in a plan view, the X-axis and the Y-axis are perpendicular to each other (see lines 8-12 of claim 4). From this, it appears that applicant is attempting to claim element (61) in applicants Figure 42. However, from the above, it appears that the first element will simultaneously exist in both the left side of and the bottom side, and therefore the first element would not be at a position closer to the left side than the other sides. This issues appears to exists with each of the other elements.

As to Claims 10, 12, 14 and 16,

The phrase "the substrate has a square shape as the rectangular shape" on lines 1-2 does not appear to have been originally disclosed and therefore introduces new matter.

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As to Claims 5, 6, and 13-16,

These claims stand rejected for incorporating the above rejected subject matter.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 9, 11, 13, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to Claims 9, 11, 13, and 15,

This claim recites "wherein the substrate has a generally square shape as the rectangular shape" on lines 2-3; however, this claim appears to fail to further limit the invention of claim 4 as a rectangular shape is generally square.

Due to the informal nature of the claims, an art rejection has not been provided for claims 4-6 and 9-16.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 2 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by ADELERHOF et al. (herein referred to as "ADELERHOF") (WO 00/79298).

As to Claim 2,

ADELERHOF discloses a magnetoresistance effect element including a spin valve film, the film including a free layer, a spacer layer, and a pinned layer whose magnetization direction is pinned, wherein the layers are successively laminated on a substrate of a single chip, the substrate having a rectangular shape which has two sides along an X-axis and two sides along a Y-axis, the X-axis and the Y-axis being perpendicular to each other in plan view, the magnetoresistance effect element having a resistance value that changes in accordance with a relative

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angle formed by the magnetization direction of the pinned layer and a magnetization direction of the free layer ((Page 1, Lines 9-29) and (Page 2, Lines 1-8) and (note Applicant's Specification, Page 1, Lines 20-28)), the magnetic sensor being formed in such a manner that a plurality of the magnetoresistance effect elements are provided on a single plane, the magnetoresistance effect elements are placed symmetrically with respect to center lines of the rectangular shape, one of the center lines is a center line of the two sides of the X-axis and perpendicular to the Y-axis and the other of the center lines is a center line of the two sides along the Y-axis and perpendicular to the X-axis, and the pinned layers of at least two of the plurality of magnetoresistance effect elements have the pinned magnetization directions that cross each other ((Page 1, Lines 9-11) and (Page 5, Lines 23-29) and (Page 13, Lines 10-20) and (Figures 10 and 11)).

(With regard to the above center lines, note the symmetry about the X and Y axis of the marked up Figure 11 provided with the Office Action mailed 12/20/2005).

As to Claim 7,

ADELERHOF discloses a plurality of magnetoresistance effect elements (Figure 11), each element including a spin valve film, the film including a free layer, a spacer layer, and a pinned

layer having a pinned magnetization direction, the element having a resistance value that changes in accordance with a relative angle formed by a magnetization direction of the pinned layer and a magnetization direction of the free layer, wherein (a) the layers of each of the magnetoresistance effect elements are successively laminated directly on a single substrate of a single chip; (b) an X-axis group of four of a plurality of the magnetoresistance effect elements constructs an X-axis magnetic sensor for detecting a magnetic field in an X-axis direction (four of the elements whose pinned direction is in along the X-axis in Figure 11), and all of the magnetoresistance effect elements of the X-axis group have pinned magnetization directions of the pinned layers parallel to each other, and (c) a Y-axis group of group of a plurality the magnetoresistance effect elements constructs a Y-axis magnetic sensor for detecting a magnetic field in an Y-axis direction perpendicular to the X-axis direction (four of the elements whose pinned direction is in along the Y-axis in Figure 11) and all of the magnetoresistance effect elements of the Y-axis group have pinned magnetization directions of the pinned layers parallel to each other ((Figures 10 and 11) and ((Page 1, Lines 9-29) and (Page 2, Lines 1-8) and (note Applicant's Specification, Page 1,

Lines 20-28) and (Page 5, Lines 23-29) and (Page 13, Lines 10-20)).

***Allowable Subject Matter***

9. Claims 3 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is an examiner's statement of reasons for allowance:

As to Claim 3,

The primary reason for the allowance of claim 3 is the inclusion of four of the plurality of magnetoresistance effect elements include a single axis magnetic sensor by full bridge connection of the four elements where the pinned magnetization directions of the pinned layers of the four elements being parallel to each other. It is these features found in the claim, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

As to Claim 8,

The primary reason for the allowance of claim 8 is the inclusion of the X-axis group of magnetoresistance effect elements construct the X-axis magnetic sensor by full bridge connection, and the Y-axis group of magnetoresistance effect elements construct the Y-axis magnetic sensor by full bridge connection. It is these features found in the claim, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

11. Applicant's arguments filed 3/6/2007 have been fully considered but they are not persuasive.

Applicant's arguments with regard to claims 4-6 are moot in view of the new ground of rejection. However, the Examiner respectfully disagrees with applicants arguments on the last paragraph of page 2 and the first and second page 3 of the

Remarks. First, applicant argues from the disclosure of Figures 8 and 9. These embodiments are distinct from that of Figures 10 and 11. Note for example that lines 10-11 of page 13 explicitly discloses that Figure 10 shows a compact double GMR-based Wheatstone bridge for a full 360 degrees angle sensing system according to ***another embodiment of the invention*** (emphasis added). Therefore, the description of Figures 8 and 9 do not pertain to the invention of Figures 10 and 11. While Adelerhof only provides a brief description with regard to Figure 11, Adelerhof nevertheless discloses that Figure 10 shows a compact double GMR-based Wheatstone bridge (lines 10-11 of page 13), and that Figure 11 shows an embodiment with a 3X4 matrix of compact double Wheatstone bridges for a full 360 degrees angle embodiment of the sensing system of the invention (lines 18-20 of page 13). Since it is disclosed that the 3X4 matrix configuration is of the sensing system, the Examiner respectfully disagrees with applicant as it appears that the entire Figure 11 represents an embodiment of the sensing system that allows for a full 360 degree angle embodiment in a matrix configuration.

With regard to applicants arguments pertaining to claim 2 in pages 1-3 of the Remarks, please see the above response. The Examiner notes that the primary figure used in the rejection of

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claim 2 is Figure 11, not Figure 10. Note the two sides along the X-axis and the two sides along the Y-axis of Figure 11. Finally, it does appear that Figure 11 is a sensor as noted in the above response. Therefore, the Examiner respectfully disagrees.

With regard to the last full paragraph on page 4 of the Remarks, the Examiner respectfully disagrees. Please see the above claim rejection of claim 7.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on Monday-Friday (8:00AM-5:00PM).

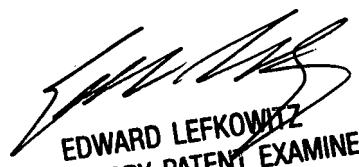
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David M. Schindler  
Examiner  
Art Unit 2862

DMS



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